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ABSTRACT

The role of research in the future of special education is discussed. The impact of research on practice is exemplified in the rise of the mainstreaming movement from research findings unable to find benefits in special class instruction for the mildly handicapped. The continuing ambivalence of the practitioner toward research is noted. The past 30 years of research efforts suggest the need for organizational support of intensive and long-term research, the development of more sophisticated research instruments, and more long-term programmatic research. Priority areas for research include: primary, secondary, and tertiary prevention; language development; family interactions; lifespan studies; social processes; technology; models of social and cognitive processes; and program evaluation. Also needed are institutions that will transform research knowledge into differential curriculum or different teacher strategies and more studies designed to answer meaningful research questions and important problems, even if this necessitates less than elegant research methodology. (DB)

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The Role of Research in the Future of Special Education

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During the past decade, special education has been adapting to the realities created by a major policy initiative, P. L. 94-142, The Education for All Handicapped Children Act. Such policy changes focus attention on the allocation of resources and proper implementation of new rules rather than program quality or impact. Quality and program impact are topics more in the domain of research and will certainly become of more concern to special educators, as the policy change has been at last completed in most communities.

It makes a great deal of sense to discuss research within the context of the "future of special education." The future is, after all, the natural habitat of research. It is where the fruits of research will be found. We should also recognize that research is the mortal enemy of the status quo. Once knowledge about a particular topic is known, it demands to be heard. It can be put aside for awhile, but in the end the voice of knowledge is powerful and will be listened to.

One simple example of that proposition would be the discovery that certain foods or exposure to certain environments can be harmful to the adult or to an embryo. Powerful economic forces such as the tobacco industry may struggle for awhile against the disclosure of such information as the dangers of smoking, or fight against the interpretation of the data which would be unfavorable to it; but, in the end, the data will speak louder and when it speaks, we will not be able to supress it, even if we wished to do so. We will be forced to take action on the new information. That is the power of research--to generate information that must be incorporated in our service programs.

Past Impact of Research on Exceptional Children

The role of research in special education, to be fully understood, must include some attention to historical influences of past research and how research is viewed by the educational practitioner. He or she who would know the future must be familiar with the past. The present is a broad river which has many historical tributaries which flow into it to shape its current flow and direction. In special education, we can identify many such trends, but three specific examples of the impact of research on practice can be noted as illustrative in that regard:

1. There was a general disillusionment in the 1960's with the efficacy of special classes to help mildly handicapped children which stemmed in large measure from an unfavorable research literature. At first, the failure to find differences in favor of the exceptional children in the special education program was attributed to the poor design of the studies themselves, but when those designs were corrected and investigators still failed to show the expected positive results of special education in special settings (see, for example, Goldstein, 1965), then the stage was set for the clarion call of Dunn (1968) which drew us away from special classes and toward "mainstreaming" or the "least restrictive environment." We could no longer ignore the evidence which was in front of us.
2. For a century the concern for the limited language development of deaf children was fought out between the two opposing educational camps of the oral vs. the manual method (Moores, 1982). The discussions were vigorous and colorful but done

with a marked absence of data. As data on the language development of deaf children became available through federal research funds, it became increasingly clear that the oral method, when used alone, had limited success in developing language in deaf children (Golden-Meadow & Feldman, 1975). Furthermore, other investigators found that early intensive use of manual communication had a positive impact on academic and social performance (Brasel & Quigley, 1977; Meadow, 1968; Moores, Weiss, & Goodwin, 1978). These results spurred on the development of some combined approaches such as the total communication method. As Moores and Moores (1980) summarized:

> Both in the classroom and in less formal settings, the trend seems to be toward the multisensory model. Auditory training, manual communication and speech training are being introduced at early ages and used in coordination with one another. (pp. 59-60)

Once again the data once available could be put aside for a brief time but, in the end, could not be ignored.

3. Finally, we are in the midst of discovering the family system as a key area of concern to replace an exclusive focus on the handicapped child. The ecology of the exceptional child described forcefully by Hobbs (1975) has finally become a major treatment focus (Blacher, 1984; Gallagher & Vietze, 1986) based upon a generation of research on the influence of the family and the social ecology upon the adaptation of the individual. As we survey the puzzling results that have been

obtained by our exclusive attention on the characteristics or behavior of the exceptional child, we may well wish to reflect on the story told by Simon (1981):

> We watch an ant make his laborious way across a wind-and-wave molded beach. He moves ahead, angles to the right to ease his climb up a steep dunelet, detours around a pebble. . . . Thus he makes his weaving, halting way back to his home. . . . the ant's path is irregular, complex, hard to describe. But its complexity is really a complexity in the surface of the beach, not a complexity in the ant. (pp. 63-64)

We have now learned that we must look at the individual in context and few educators are now taken seriously who do not incorporate this concept in their thinking.

The Attitude of Practitioners to Research

There would be a general consensus from educators, I believe, that research has played a significant role in the rapid emergence and expansion of special education over the past four decades. Nevertheless, there are many educators who remain ambivalent about research and its uses. Before considering what the future of research will be or should be in special education, we might pause for a moment to consider these ambivalent feelings.

It is the fate of the practitioner, whether it be pediatrician, teacher, psychologist, or social worker, that they must, in the practice of their profession, go beyond the established knowledge of the field. Whenever there is a patient who is hurting, a child who is misbehaving, or a

family disintegrating, the practitioner does not have the luxury of saying, "we will wait to act until we have more research evidence that justifies our clinical action." If they are responsible and efficient clinicians, they will act on the currently available information and hope for the best.

When research catches up, some time later, the knowledge spawned by the research may well reveal that some of the actions that were taken by the practitioners were not optimal, or even correct. This is not likely to please the hardworking teacher or medical practitioner. Nevertheless, if data is available, it is hard to ignore it over the long run. Even if there is a thirty-year history of prescribing certain medicines for a given condition, if solid research becomes available to suggest that those medicines are useless, then the medical practitioner cannot really ignore that information. Similarly in special education, if research identifies areas that do not seem to have merit in helping exceptional children develop, then those practices need to be modified. One example of such practice would be the visual, perceptual-motor training that formed a large part of the special educational program of many young children who were brain-injured or learning disabled. The accumulation of evidence suggested that such exercises yield little in terms of tangible benefits to the youngster and indeed fill up a valuable time space where other more relevant materials and activities can be introduced (Arter & Jenkins, 1979).

Nevertheless, clinicians who have spent a large part of their career engaging in such activities are not likely to be overjoyed with such research findings and indeed may be inclined to want to quarrel with them. The hard facts are that the truth, or our research approximations to the truth, are often vexing because they may force us to abandon some well-established and comfortable patterns of behavior. So if the researcher

wonders why he or she is not viewed as a boon to mankind, as they may secretly feel they are, then perhaps an understanding of these conditions may help bring them to a better sense of reality.

RESEARCH ORGANIZATION NEEDS

How does one organize a future systematic research effort to aid exceptional children? We now have a track record of almost three decades of intense interest on the part of the federal government in providing research funds to study the problems of exceptional children. Our organization of future research efforts should profit from that experience.

Organizational issues. One of the clear messages from our research history is that small individual studies of a dissertation-like quality are not likely to impact on the difficult and complex issues that face the practitioner who works with exceptional children. The research, to be useful, must be both intensive and long-term. In many instances, it should have a multidisciplinary approach to it to reflect the wide diversity of needs and service delivery patterns used with exceptional children and their families.

At the Frank Porter Graham Child Development Center at the University of North Carolina at Chapel Hill, we have been fortunate to be the beneficiaries of two such commitments to long-term and longitudinal research. The first of these comes from the National Institute of Child Health and Human Development through their Mental Retardation Centers program which began supporting research in the mid-1960's. Through that program, we have been able to conduct longitudinal studies, beginning at birth, on youngsters suspected of being at high risk for mental retardation and a variety of developmental disabilities. Through these studies we are in the process of documenting what can and cannot be expected from early intervention programs of a fairly intensive nature (Ramey, Yeates, & Short, 1984).

The second long-term commitment came from the Office of Special Education Programs through their Early Childhood Centers which allows us, in this case, five years to carry out a variety of studies on families of handicapped children, tracing the effect, over time, of stressors, available resources, and personal perceptions on the adaptation of the family to the presence of a handicapped child. Such longitudinal studies looking at changes in families or children over time would be quite impossible without the institutional commitment from NICHD and OSEP to long-term, institutional support (Gallagher, 1983).

Instrument development. One methodological problem that prevents us from more sophisticated investigations into complex family and social interactions is that we have a limited set of instruments through which to pursue some of the questions. We often curse our scientific tools while we use them, anyway, because they are the "best available instruments." A deliberate and planned effort on the part of supporting agencies to contract for the development of needed instruments could enable investigators to more easily capture these complex interactions and could upgrade the quality of research for decades to come. The presence of organized research units, Centers and Institutes, are a great help in instrument development because they have the diversity of staff, stability and support systems necessary to carry out the long and complicated process of instrument development.

Programmatic research. One of the other advantages of organized research units is that they can take the responsibility for long-term, programmatic research. Moores (1986) stresses the importance of programmatic research in the field of deaf education which has too often seen small and fragmented research studies, not relevant to educational

practice. He identifies the three roles for the applied researcher which fits the situation for most researchers in the field of exceptional children:

> First is a commitment to basic long-term examination of fundamental principles. This means linking one's work with basic knowledge fields such as anthropology, sociology, psychology, and human development; second, identifying areas in which well-formulated research may have a positive influence on practice; and finally, to interact in mutually beneficial ways with teacher-trainers at the university level as well as with educators in the schools. (p. 141)

Moores describes a series of programmatic research efforts conducted by a research unit in Gallaudet College that includes the study of the development of deaf children during their first three years of life, the developing literacy in hearing impaired children during the ages three to eight, and the adaptation of secondary school hearing impaired children to public high school programs. Such programmatic effort is made possible by a "multidisciplinary core of highly skilled professionals with adequate support working cooperatively on well-defined programs of inquiry."

Priority Areas for Research

Once the organizational units are in place, then what should be the foci for our current and near future research efforts? Building an impressive organization is not of much use if you do not study important issues. Therefore, what would be some major priority areas in the exceptional child field that need investigation? We need to further investigate those dimensions that have been recognizable emphases in the

past--the prevention of disorders, the amelioration of problems that stem from exceptionalities, and the maximization of potential of the individual.

Scott and Carran (1986) distinguished three different types of prevention: primary, secondary and tertiary:

1. Primary prevention means minimizing the level of risk for a disease or condition. In primary prevention, one promotes health and adjustment.
2. Secondary prevention occurs where a risk factor or disorder can be reduced, eliminated, or cured. Head Start is an example of a secondary prevention program, aiming to place its graduates in regular education.
3. Tertiary prevention represents activities leading to the management of the condition so that the patient may lead as nearly a good and productive life as possible by bringing the individual to his/her maximum potential. For moderately to severely impaired children, this would mean not eliminating their handicap but strengthening their adaptive capabilities to the maximum. For gifted children it means releasing all of their multiple potential for productive use.

One obvious strategy in prevention would be to eliminate or reduce risk factors which appear linked to the production of handicapping conditions. One risk factor that appears to be increasing is the children with low birth weight who are now surviving where previously they would have died at birth (Scott & Masi, 1979). Infants born weighing 700-800 grams are approximately at a 50% risk for being handicapped (Britten, Fitzhardinge, & Ashby, 1981).

One of the serious special education policy issues in dealing with youngsters at risk is that it is not always possible to identify which of these youngsters will develop the handicapping condition in the preschool years. Yet, many programs and funding agencies insist on a positive diagnosis of a handicapping condition before special educational services can be provided. Scott and Carran (1986) suggest that a different strategy may have to be used in the preshool years:

> At the preschool level, we will have to create noncategorical programs aimed at children who are born <u>at risk</u> for school failure due to any combination of social, biological, familial, and environmental risk factors. (p. 78)

This would mean a public health approach designed to create a favorable environment for overall development rather than the clinical approach of treating a specific individual disease or condition.

Each of these potential research foci noted below are complex and difficult topics, which probably explains why there is still much work to be done on them.

<u>Language development</u>. We need to focus more clearly on the development of language in exceptional children. Language is, after all, both the primary means of social communication and the medium through which we transmit past knowledge to new generations. Any substantial deficit or flaw in that development has serious and long-term developmental ramifications. Not surprisingly, people in deaf education have been preoccupied with that topic, and we need to learn more from their efforts and apply them in other areas of developmental difficulties as well. On this topic, as in other

problem areas, we need to draw upon the expertise of psycholinguists and other specialists who have thought about the language issue from the nonhandicapped perspective.

Family interaction. We have become increasingly aware during the last decade of the complex interactions within the family of the exceptional child and how those interactions change and modify over the various family stages or ages of the participants. Such complexity must be carefully documented if we are to be effective in working with families as they try to cope with the presence of a family member with a handicap or in their attempts to maximize the potential of a gifted student. As in the case of language, we need to profit from the ideas and conceptual systems developed by sociologists and anthropologists who have been studying general family issues for many years.

Lifespan studies. We need a variety of lifespan studies that investigate what happens to exceptional children and adults over key transition points in their life history--the entrance into school, the movement from elementary to secondary school, their transition from school to work or vocational activity, and the transition into adulthood and adult responsibilies. All of these transitions represent major shifts in the life of the exceptional individual because of the heavy impact that the environment has upon that child. If we conceive of adaptation being the product of child, family, and social factors ($A = C \times F \times S \times CF \times FS \times CS$) and their interactions, then changing the school environment has the potential for modifying significantly the adaptation.

We need to, therefore, study the changes in cognitive, social, and emotional development in the exceptional individual, and the social dynamics of their interaction with others, through these transition periods.

Understanding these transitions and their stresses can provide the practitioner with much more effective information regarding needed coping mechanisms to cope with developmental change.

Social processes. Cognition, with its recognizable patterns of development and information processing, with its precise dimensions of memory and reasoning, have been somewhat easier to chart than the complex of social patterns and temperament qualities of the individual. However, these latter qualities often have a great deal more to do with effective adult adaptation than do the intellectual characteristics. We need much more intensive study of the development of, and stimulation of, cooperative behaviors, of persistence, of empathy, and the constructive reciprocal social interaction between parent and child and sibling and child. Much of our instructional program for children with handicaps should probably be devoted toward the enhancement of these positive social characteristics instead of treating them as a side issue to the presumed more important cognitive learnings that form much of our curriculum today.

Technology. For many years, special education has been among the leaders in education in the creative use of technology. Technology has been used to overcome the mismatch between environmental demands and individual capabilities (Weisgerber, Dahl, & Appleby, 1981). This mismatch between environmental demands and individual abilities can be coped with by:

1. Altering the capability of a person so that environmental demands can be satisfied
2. Provide an environment that eliminates the mismatch
3. Provide a device to smooth the interface between the person and the environment at the point of interaction.

In particular, there has been a development of access technology which refers to the equipment, equipment interfacing, software, instruction, and materials enabling the independent use of microcomputers by handicapped persons (Ashcroft, 1986). For example, the Kurzweil Reading Machine which converts print to speech output for visually handicapped children has now developed a special interface that enables the reading machine to convert English text from a computer or a cathode ray tube terminal into speech. The development of complex communication boards and voice-operated systems for computer programming are other examples of what Ashcroft refers to as a paradigm shift in our thinking about education of handicapped children. A report from the Office of Technology Assessment (1982) regarding the information revolution states:

> A key element of all of these educational needs is that they will constantly change. In a rapidly advancing technological society, it is unlikely that the skills and information base needed for initial employment will be those needed for the same job a few years later. Life-long retraining is expected to be the norm for many people. (p. 8)

Such life-long retraining and the continued development of technological advances will be necessary if the handicapped are to keep pace in this rapidly changing environment. Substantial investments in research and development funds to allow that to happen would seem to be one of the clear responsibilities of the federal government.

Models of cognitive and social processes. In education, as in other fields, where practioners have to deal with daily problems, there is an understandable lack of patience with general theories or models, but in the

long run there is nothing more economical than a good theory or useful model, and it is the development of models that we should be striving toward through research. A few examples would suffice to make this point. Guilford's model of the Structure of Intellect opened up for consideration the whole area of creativity as a dimension of importance in instruction as well as in human behavior. A whole generation of teachers of gifted children have grown up using instructional methods and devices that have been built around, and inspired by, the Structure of Intellect model (Gallagher, 1985).

We are now beginning to utilize more effectively various information processing models such as presented by Siegler (1986), Sternberg (1982), and Gardner (1983). These models, which focus on how individuals receive, transform, and process information, have caused us to look more closely on elements such as the executive function or decision making function, and on topics of metamemory or metacognition, the "thinking about thinking" processes. We have focused our efforts more upon attention and perception, the means by which we receive information. Hopefully, the refinement of these models will find much more fruitful application in instruction in the near future.

One final example of a useful model is the use of a coping structure developed by Hill, as extended by McCubbin, in the field of family adaptation (Hill, 1949; McCubbin, 1979). Hill's basic and somewhat simple model identifies three major domains that impact on the adaptation of individuals in crisis. The first of these is the nature of the stressor itself, whether it be a tornado or the birth of a handicapped child. The second major domain is the availability of physical and social resources and supports. The third domain related to adaptation is the perception of the

individual of themselves and their situation. It is a combination of these three domains, and the many complex factors within them, that eventually determine successful adaptation or maladaptation in families. Understanding such a model can help us understand why certain families not only adapt but seem to flourish under what would seem to be a heavy stressor, whereas others seem to disintegrate under what seem to be the most modest of pressures.

Program Evaluation

One of the areas that has been closely related to research has been program evaluation. This area has been referred to as the "spinach of education" in the sense that it is very good for our programs, but few people in the programs enjoy the experience. While program evaluation uses many of the traditional measuring instruments of the researcher, and reports of evaluations often seem to be similar to research reports, there is a fundamental difference between research and evaluation.

In the case of evaluation we are attempting to gather evidence leading to a decision about a specific program, whereas in research we are looking for data that can be generalized to a larger group of people or set of ideas. While the evaluation study can sometimes have larger applications, the basic data is supposed to refer to a specific decision about a concrete and finite topic.

Since there is a general reluctance to financially support evaluation studies, such efforts need to be institutionalized as part of the normal expectations of a program. The politician or educational administrator who has been responsible for establishing the program has already said everything positive that they can think of about the possible benefits of a program in order to convince others that it should be supported. Any

serious effort at evaluation then is bound to bring bad news--a less than optimum result. Few politicians want to hear that about their own programs, and neither do educational administrators.

Yet, well-done evaluation programs can be of substantial help to the improvement of the program. Therefore, we would recommend that evaluation become a specific part of every program in special education, and that these reports would be both formative in nature (designed to help the project staff) and summative (allowing decision makers to determine overall value) in character. This will not be a popular stance with practitioners, but it is a statement of accountability that exceptional children and those who care about them should applaud. Therefore, in the budgets of demonstration centers or special projects, there should be funds made available to carry out program evaluation.

Research utilization. The generation of research information is one valuable element in this process, but by itself it will not help the practitioner very much. One useful analogy is that research knowledge is like crude oil out of the ground, an extremely valuable product, but you would not want to put it directly into your automobile. That oil has to be refined and transformed to meet specific purposes before its true value is realized. We need a different set of organizational components that are specifically designed to transform, synthesize, and apply existing knowledge to meet the needs of the practitioner.

We need institutions or components that will transform research knowledge into differential curriculum or into different teacher strategies. We need additional organizational units to provide technical assistance and to disseminate widely proven knowledge and products. We need demonstrations of exemplary practices in order to encourage others to adapt these practices to their own needs and settings.

The Handicapped Children's Early Education Program is an example of a well-planned federal government effort which contains within it support for research centers which generate new knowledge, demonstration centers which illustrate the best of what we now know in practice, and technical assistance services to see to it that there is a synthesis and spread of knowledge and good practice in the most expeditious way. In many respects, the Handicapped Children's Early Education Program stands as a model of good government planning that yields both effective research and research utilization practices (DeWeerd, 1983).

Research Design and Style

Trends in research occur in the manner of designing and conducting research as well as in the content of the research itself. Much of how investigations have been carried out in special education mimics what has been done in the social sciences, which borrowed much of their methodology from the biomedical and physical sciences. We have begun to see that such designs may have limitations when applied to the highly idiosyncratic populations that we deal with in exceptional children. Case studies and small sample studies with all their faults may well yield more useful information than studies using larger but more heterogeneous samples.

Do we need more investment in research and in research training? It would come as no surprise to the reader that this author believes that few expenditures have as great a potential to bring benefit to exceptional children and their families. Having more research money, by itself, will not guarantee positive results. It is not terribly helpful if we have a platoon of studies all posing inappropriate questions and faulty designs. The answers we get will hardly add to our wisdom. Mather and Kirk (1985) remind us that several generations of graduate students have had to learn

Type I errors (rejecting the null hypothesis, when it is true) and Type II errors (accepting the null hypothesis, when it is false). They introduce a Type III error--asking the wrong research question. There are probably more serious problems in our field with Type III errors than the other two combined.

Mather and Kirk provide the following example. We often see the question asked, "DO CHILDREN WITH READING PROBLEMS HAVE VISUAL DISCRIMINATION PROBLEMS?" The approach to this question has often been to get a sample of children with reading problems, and a comparison sample of children without reading problems and compare their performance on visual discrimination tasks. With this type of design, we often find that the statistical answer to the question, "is there a difference between the two groups?" The investigator surveying his findings will report no statistically significance and conclude that reading problems are not related to visual discrimination problems. The reason for such a finding appears to be that there are a myriad of possible causes for reading problems, of which severe visual discrimination problems would have a rare prevalence. When statistical comparisons are made, the one or two children with severe visual discrimination problems in the reading problem group would not be enough to sway the results.

Well, what is the right question to ask then? DO CHILDREN WHO HAVE A SEVERE VISUAL DISCRIMINATION PROBLEM HAVE TROUBLE READING? This question is almost certainly going to be answered in the affirmative. We should not, therefore, with our research designs assume a unitary cause for any of the problems with which we deal. We are more likely to gain useful knowledge by seeking subpopulations within the larger categories and distinguishing them from one another or conducting careful studies of children with the presumed

disorder. The literature in the field of learning disabilities is awash with studies that have posed a variation of the first question (Do children with learning disabilities . . . ?), and we have received what is very likely to be misleading and inaccurate results (Arter & Jenkins, 1979).

Another reason for confusion in research findings about a miscellaneous category such as learning disabilities is that the researcher may accept the educators' procedures for identifying certain groups of children, instead of setting their own conceptual criteria. For example, if we attempt to study learning disabilities by finding children who have been placed in classes for learning disabilities in five separate communities, we will have five different samples of children, different among and between themselves so much that few conclusions could be drawn besides how foolish we were to allow others to define our samples for us.

One further design issue is how to capture the influence of small or modest effects, of which it appears we have many, on the developing exceptional child and family.

Research in the social sciences has shown many signs of maturation over the past decades and now offers great promise for significant contributions to the field of exceptional children in the immediate future. It requires a steady flow of dollars, intelligent administration, and the commitment of a cadre of researchers to attack that wildest of frontiers, the developing human being in all his/her infinite variations.

SUMMARY

The role of research in the field of special education has been a complex and puzzling one. On one hand, the practitioner is often fearful that the researcher will emerge with information damaging to their current practice and, on the other hand, hopes that there will be produced new methods or materials that can be instantly usable with their exceptional children. Such expectations are sure to be disappointed because of the need for transformation and synthesis of data before it can be effectively used in the classroom. Hence, a state of tension often exists between practitioner and researcher.

The United States has led the way in the development of complex organizational structures designed to carry out highly differentiated tasks in the world of business and industry. There is a similar organizational need in the field of special education, but since education is not a profit making organization (though highly beneficial to the society), support for such organizational structures must come through public agencies. Such Centers or Institutes can focus upon research, development, demonstration, and dissemination and are particularly useful in such tasks as instrument development and the execution of multidisciplinary longitudinal research.

Research emphases in the past have often been represented by studies that could be done with standard instruments and commonly accepted research designs. This has meant that problems where there is a complex set of interacting factors, or a good deal of idiosyncratic response by individual children, were avoided as methodologically unfeasible. Current research priorities should focus upon such complex problems as the classroom interactions in both affective and cognitive domains between teacher and student, the impact on a child with handicapping conditions on family

systems, the development of social processes, the sequential interaction of child and environment leading to differing types of adaptation, and the interactive role of technology in special education.

In short, we should do the difficult studies (even with small samples or single subjects) that are important even if they almost always result in less than elegant research design or methodology. We need studies that bring more insight into our complex present, and which may project usefully into an even more complex future.

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